CLAIMS

1. A method of evaporating a liquid sample contained in a sample holder which is mounted within a chamber and rotated by a rotor therein during the evaporation so that centrifugal force is exerted on the contents of the sample holder during the process whilst a pressure below atmospheric is maintained in the chamber in manner known per se, so as to leave as a residue any solid material dissolved or otherwise mixed in the liquid forming the sample, characterised by:

mounting a transducer to monitor the force acting on the sample holder relative to the rotor when rotating at a given speed and obtaining a force signal therefrom, supplying the force signal to a computer means, programming the computer means to compute a value equivalent to the centrifugal force exerted on the sample holder due to rotation of the rotor at said given speed, further programming the computer means to compute a weight value from the force signal using the computed centrifugal force, and further programming the computer means to generate a control signal for controlling the evaporation process in dependence on the computed weight value.

2. A method as claimed in claim 1, further comprising the steps of mounting a second transducer to monitor the speed of rotation of the rotor, obtaining a speed signal therefrom, and supplying the speed signal to the computing means for computing said weight value.

3. A method as claimed in claim 1 ~~or claim 2~~, wherein the computing means is adapted to rotate with the rotor.

4. A method as claimed in ~~any one preceding~~ claim, wherein the computing means is programmed to convert the transducer signals into a form suitable for transmission to an external receiver.

5. A method as claimed in claim 4, wherein the computing means converts the transducer signals into digital signals by which a carrier signal is modulated to effect the said transmission.

6. A method as claimed in ~~any one of claims 1 to 5~~ Claim 1, wherein the force and speed signals are produced continuously and the weight and centrifugal force values are continuously computed therefrom.

7. A method as claimed in claim 6, wherein the computing means has stored therein a value equivalent to the weight of the sample holder, and is further programmed to compute a value equivalent to the weight of the contents of the holder by deducting from the computed weight value a value equivalent to the known weight of the sample holder.

8. A method as claimed in ~~any one preceding~~ claim 1, wherein the computer means computes the rate of change of the computed weight value.

9. A method as claimed in ~~any one preceding~~ claim 1, further comprising the step of heating the sample during rotation in the chamber to increase the rate of evaporation.

10. A method as claimed in claim 9, comprising the step of controlling the supply of heat to the sample in dependence on the computed weight value.

11. A method as claimed in claim 8, comprising the step of controlling the supply of heat in dependence on the computed rate of change of weight value.

12. A method as claimed in claim 11, wherein the supply of heat is reduced as the rate of change of weight with time starts to decline, and the evaporation process is terminated when the rate of change drops to zero, indicating that the sample is dry.

13. Apparatus for evaporating a sample comprised of solid material dissolved or suspended in a liquid, comprising a vacuum chamber, a rotor therein, drive means for rotating the rotor relative to the chamber, a sample holder for containing the sample

connected to the rotor, transducer means associated with the sample holder and the rotor for generating a force signal indicative of the centrifugal force acting on the sample holder as it is rotated at a given speed, and means for transmitting transducer signals to computing means programmed to convert the signal at any instant to a computed value proportional to weight, the computing means being further programmed to generate a process control signal for controlling the evaporation process in the chamber.

14. Apparatus as claimed in claim 13, further comprising second transducer means associated with the rotor for generating a speed signal corresponding to the speed of rotation of the rotor, the speed signal being transmitted to the computing means for computing a weight value.

15. Apparatus as claimed in claim 13 ~~or claim 14~~, wherein the first mentioned transducer is a load cell.

16. Apparatus as claimed in claim 13 ~~or claim 14~~, wherein the first mentioned transducer is a strain gauge.

17. Apparatus as claimed in claim 13 ~~or claim 14~~, wherein the sample holder is movable relative to the rotor and the force transducer is a position sensor adapted to produce a signal indicating the position of the sample holder relative to the rotor, as determined by the instantaneous centrifugal force acting on the sample holder, causing it to move relative to the rotor.

18. Apparatus as claimed in claim 17 wherein resilient means resists the movement of the sample holder relative to the rotor.

19. Apparatus as claimed in ~~any one of claims 13 to 18~~ Claim 13, wherein a plurality of sample holders are mounted on the rotor and a force transducer is provided for at least selected ones the holders.

20. Apparatus as claimed in ~~any one of claims 13 to 19~~ Claim 13, wherein a mechanical device is

attached to the rotor or a spindle on which the rotor is carried and by which it is rotated, which automatically adjusts its centre of mass in response to out-of-balance forces acting on the rotor due to differential evaporation of samples.

21. Apparatus comprising a vacuum chamber, a rotor mounted therein for rotation in use about a generally vertical axis, a drive means for rotating the rotor, at least two sample holders mounted on the rotor, each sample holder being pivotal in use about a generally horizontal axis in a radial manner relative to the axis of rotation, a bearing raceway incorporating a plurality of ball bearings which do not fully occupy the circumferential extent of the raceway and which in rotation are automatically distributed around the raceway to counteract any imbalance forces, the raceway being mounted to the rotor or a spindle driving the rotor, thereby to reduce any imbalance caused during the spinning of the rotor as result of differential evaporation of liquids from the sample holder.

22. Apparatus as claimed in claim 21, wherein the ball bearings are formed from a high density material such as Tungsten or depleted Uranium.

23. A method of measuring the weight of a liquid sample in a sample holder attached to a rotor in a vacuum chamber of an evaporating centrifuge, comprising the steps of mounting a transducer to monitor the force acting on the sample holder relative to the rotor during rotation, supplying a force signal to a computing means having stored therein a stored weight value corresponding to the empty weight of the sample holder, the computing means being programmed to convert the force signal to a weight value for a given speed of rotation of the rotor, the computing means being further programmed to deduct from the computed weight value said stored weight value.

24. A method as claimed in claim 23, further comprising the steps of monitoring the speed of rotation of the rotor, and supplying a speed signal to the computing means for computing said weight signal.

25. Centrifugal evaporation means including weight monitoring and process control means constructed and arranged substantially as herein described with reference to and as

illustrated in the accompanying drawings.

26. Methods of monitoring weight and rate of change of weight of evaporating samples, and of controlling a centrifugal evaporation process in dependence on the monitored weight or rate of change of weight, substantially as herein described with reference to and as illustrated in the accompanying drawings.